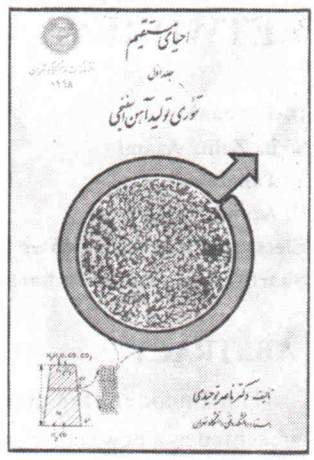

عنوان: **احیای مستقیم (تکنولوژی) جلد دوم**
مؤلف: **ناصر توحیدی**
ناشر: **دانشگاه تهران**

تکنولوژی تولید آهن به روشهای احیای مستقیم، به ویژه روشهای صنعتی احیای مستقیم که در ایران بر اساس آنها آهن اسفنجی تولید خواهد شد، در کتاب به تفصیل مورد بحث قرار گرفته است. هر فصل این کتاب دارای مقدمه و چکیده‌ای است و فرمولها، جداول و تصاویر منحصر به هر فصل است. در شش فصل اول کتاب تعدادی تمرین نیز مورد تجزیه و تحلیل قرار گرفته و لیست منابع مورد استفاده در انتهای کتاب نوشته شده است.

این کتاب در ۱۴ فصل با عناوین زیر است:

فصل ششم: گندله سازی و ویژگی‌های آن
فصل هفتم: دسته بندی روشهای تولید آهن
فصل هشتم: احیای مستقیم سنگهای آهن به روش اچ- وای- ال
فصل نهم: احیای مستقیم سنگهای آهن به روش میدرکس
فصل دهم: احیای مستقیم سنگهای آهن به روش پوروفر
فصل یازدهم: احیای مستقیم سنگهای آهن به روش آرمکو
فصل دوازدهم: روشهای تجارتی احیای مستقیم سنگهای آهن با زغال
فصل سیزدهم: روشهای احیای مستقیم سنگهای آهن با زغال در دورهٔ دوم
فصل چهاردهم: احیای مستقیم سنگهای آهن به روشهای صنعتی و نیمه صنعتی غیر تجارتی
فصل پانزدهم: احیای مستقیم سنگهای آهن به روشهای نوین
فصل شانزدهم: احیای مستقیم سنگهای آهن به روشهای با اهمیت صنعتی محدود
فصل هفدهم: روشهای احیای مستقیم بدون کاربرد در سطح صنعتی و آزمایشگاهی غیر صنعتی
فصل هجدهم: تحلیل کلی فرایندهای مختلف احیای مستقیم سنگهای آهن
فصل نوزدهم: کنترل بار کوره‌های احیای مستقیم

STATE REDUCTION IN DYNAMIC PROGRAMMING*

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ABSTRACT

Dynamic programming is a well-known approach for optimization of a separable function which provide a global optimal solution even in cases of nonconvex programming problems. The use of this pressful technique for discrete variable problems has been limited by its excessive computer storage and computational requirements. These computational problems become more severe whenever the state variables and defined by a vector of more than three dimensions. This is the well known problem of dimensionality of state variables in the dynamic programming technique.

In this research several ways to reduce the dimension of state variables have been considered and compared from the view of their effectiveness. Specifically, the Lagrangian multipliers, imbedded state technique and surrogate constraints are considered, to overcome the problem of dimensionality. Each of these approaches suffer from a number of weaknesses and yet posses some advantages in obtaining the optimal solution. Therefore, an algorithm is developed to incorporate the advantages of several approaches in a single solution technique. The developed algorithm is tested and the results are presented. The results obtained from the test problems are indeed very encouraging.

* *Presented at the 2nd Conference of the Association of Asian Pacific Operational Societies within IFORS, August 27-30,1991, Peking , China.*

ENCODER DECODER NEURAL NETWORK*

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ABSTRACT

The Encoder Decoder Neural Network (EDNN) is presented as a new vector quantization algorithm. EDNN is composed of two separate two layer perceptrons, the encoder and the decoder nets. The nonlinear function of the encoder output neurones are hard limiters, and the other neurones have sigmoid nonlinearity functions. Output of the Encoder Network is considered as the quantized bit pattern of the sample vectors.

EDNN is trained in two stages. At the first stage, the bit pattern is dictated by vector quantized data of SOHC with the definition of neighbourhood in the Hamming space. At the second stage complete EDNN is further trained with modified Error Back Propagation. In this stage the input and desired output of the network are the same.

THE EXPERIENCE OF AN INTENSIVE TECHNOLOGICAL GRADUATE COURSE**

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ABSTRACT

The present work describes the experience of an intensive course designed to meet the pressing requirements of mainly a shipbuilding industry in Iran which looked for specialists in naval architecture and marine structures, in the shortest possible time.

As a coordinator of the course, the present author found that first degree mechanical and civil engineering graduates were suitable candidates, as had been thought when planning, since they showed competence during the course and seem now to be doing well in industry.

INTRODUCING NEGATIVE CORRELATION IN SIMULATED PAIRS OF OBSERVATIONS WHERE REJECTION METHOD IS APPLICABLE*

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ABSTRACT

A primary of simulation studies is obtaining point as well as interval estimates for the mean of a response variable. How accurate such estimates are depends, among others, on the sample size. Variance reduction techniques try to achieve a higher degree of accuracy through introducing negative correlation between each pair of input deviates. Such a scheme makes it possible to improve the point estimates accuracy while keeping the sample size relatively small. Application of variance reduction techniques to rejection method are rather new. In this work two schemes of variance reduction, i.e., complementary random numbers and stratified are compared under the circumstances where the rejection method is applicable.

* *Presented at International Conference on Neural Network Applications to Signal Processing August 17 -20 1993. Singapore.*

** *Presented at 20the Symposium "Engineering Education 91", September 11-14,1991, Dresden, Germany.*

* *Presented at the 2nd Conference of the Association of Asian Pacific Operational Societies within IFORS, August 27-30,1991, Peking, China.*

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ABSTRACT

A simple mechanical drive system is developed which is able to perform a fine course of angular motion for the scanning of the optical elements. The drive consists of a lead screw, a drive nut, sine bar legs, and an output shaft which rotates the optical component. The resolution of the system depends upon the lead screw and the nut, which has been improved to 0.5 thread/mm in this work. With a 200 step per turn stepper motor, it is possible to have a minimum step size of 2.5 microns. Two systems with different resolutions were built, and the reproduceability of each system at several motor speeds was measured. A repeatability of better than 2 steps over 6000 step counts was found for systems in the vertical and horizontal movements. This system can be used for scanning optical elements, such as gratings and other angle tuning components. It is designed in a such a way so that a smaller version of this system which could find useful application in compact systems can be constructed.

OPTIMAL CONTROL OF STRUCTURES WITH ACCELERATION, VELOCITY AND DISPLACEMENT FEEDBACK*

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ABSTRACT

An optimal control algorithm with acceleration, velocity and displacement feedback is proposed. The algorithm, that is derived by minimizing a quadratic time- dependent performance index, includes constant control gains that need to be calculated once in the begining of the control process. Numerical results indicate that for base isolated structures, the utilization of acceleration feedback in the control scheme performs as well as the previously proposed algorithm with velocity - displacement feedback. In case of non- base isolated structures, the new scheme demonstrates a better performance. Due to difficulties present in measuring the displacement of a system, inclusion of the acceleration feedback in the control algorithm, increases its practical value for possible implementations.

* *Published in Journal of Engineering Mechanics. ASCE. Vol. 119, NO, 10, PP. 1993 - 2010. October 1993.*

ENGINEERING ANALYSIS OF SHOULDER DYSTOCIA IN THE HUMAN BIRTH PROCESS BY THE FINITE ELEMENT METHOD*

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ABSTRACT

This paper presents an engineering analysis of shoulder dystocia (SD) in the human birth process which usually results in damaging the brachial plexus nerves and the humerous and/or clavicle bones of the baby. The goal is to study these injuries from the mechanical engineering point of view. Two separate finite element models of the neonatal neck and the clavicle bone have been simulated using eight-node three-dimensional elements and beam elements respectively. Simulated models have been analysed under suitable boundary conditions using the "SAP80" finite element package. Finally, results obtained have been verified by comparing them with published clinical and experimental observations.

* *Published in Journal of Engineering in Medicine, Vol. 20, PP. 243 - 250, 1992.*

ABSTRACTS OF PAPERS PRESENTED AT INTERNATIONAL CONFERENCES

The abstracts of papers published in this magazine pertain to research projects conducted all over I.R. Iran, including those papers which have been printed previously in reputable scientific publications, and are not limited to the Sharif University of Technology. The Editor would be happy to include abstracts, in future editions, of all scientific papers presented by researchers throughout the country, with a view to keeping the academia and professionals informed about research activities carried out by Iranian scientists.

EFFECTS OF STORM PATTERNS ON RUNOFF HYDROGRAPHS*

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ABSTRACT

The use of design storms in storm runoff simulation has, for a long time, been a topic of controversy. The conventional single - peak storms concentrate the worst conditions of the storm events of record used in the analysis.

In this investigation alternative multi - peak storms which represent the average shape of the recorded events is proposed. The resulting design storms of 8 and 18 hours were then applied to a hypothetical watershed and the simulated hydrographs were compared to those generated by a single - peak storm of the same rainfall total.

The model used in generating the hydrographs was pennstate runoff model (PSRM). The model computes runoff for single storm events by a kinematic wave routine similar to that used by the HEC-1 (1991). PSRM is a much smaller computer program than HEC-1 fitting comfortably on a 300K floppy disk, and providing the option of calling for a very concise summary output.

Hydrologic modeling confirmed that hydrographs generated by multi - peak storms had consistently lower peaks than those generated by the conventional single - peak storms of the same total rainfall. It seems therefore, that the conventional method of constructing design storms, while not necessarily overestimating flood peaks, tends to result in conservative estimates.

* *Published in Water Resources Bulletin, Vol. 28, No. 3, PP. 569-575, June, 1992.*

A SIMPLE DRIVE SYSTEM FOR SCANNING OPTICAL ELEMENTS*

* *Presented at Third International Conference FMIM 93, University of Limerick, Republic of Ireland, June 28-31, 1993.*